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EDITORIAL DEPARTMENT NOTE

In this issue of our Bulletin we are publishing three papers dealing with the clerical or office division of modern business organizations. In a sense it is just as much a production division as any other part of the organization. Its output may be measured and incentives may be applied just as in any other department. The first paper reveals the methods of applying financial incentives for clerical services in use by the Westinghouse Electric & Manufacturing Company. The second paper describes the methods of measuring the output of office workers in the Hawthorne Division of the Western Electric Company. The third paper describes an emergency plan of salary reduction and readjustment put in effect by another large company in the electrical field. It helped to solve the problem of reducing the budget without any serious effects on the morale of the employees.

A. W. Bass, the author of the first paper, spent three years as assistant to the senior credit man of Marshall Fields and Company at Chicago. He then became Secretary and Auditor of the Webster Manufacturing Company of Tiffin, Ohio. Since uniting with the Westinghouse Electric and Manufacturing Company, he has been in successive charge of the following activities: statistical and graphical work for the manufacturing vice president; director of works accounting activities; assistant to vice president, with responsibility for the control of manufacturing stocks and time-study work for all manufacturing plants; now occupies the position of director of budgets, along with which he has had the administration of supervisory incentive plans involving about 1,400 of the key men of the Westinghouse organization and more recently has taken on the organization and development of incentives for the clerical activities of the company.

He is a past President of the Pittsburgh Chapter of the N. A. C. A., and served three years as a National Director of the organization in charge of Standardization.

William H. Smith, the author of the second paper, attended the Armour Institute of Technology. He has spent his whole business life with the Western Electric Company on accounting and associated clerical work, such as cost, pay roll, mechanical compiling, and shop clerical. He is now Chief of the Accounting Service Division.

E. P. Case, the author of the third paper, was graduated from Syracuse University in 1925. A few months later he joined a large company manufacturing electrical products. He is now Chief Accountant and Assistant to the Treasurer of that same company. Mr. Case has been a member of the Syracuse Chapter since 1926. He served as Director of Publications during the year 1931-32 and is now Director of Programs for the year 1932-33.

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April 1, 1933

FINANCIAL INCENTIVES FOR CLERICAL SERVICE

By A. W. Bass, Director of Budgets,
Westinghouse Electric & Manufacturing Co.,
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FOR the better part of three years now, business and industrial concerns and we as individuals have been carefully reviewing our expenditures. Our first endeavor was to eliminate luxuries, and having done that we went a step further and sought methods of securing at a lower cost those items classed as necessities. Fixed habits of thought have found travel a bit rough, for the jolts have been many. The amount of mere rubbish we gather about ourselves when times are flush is little short of amazing, for in such times progressive thinking grows a bit ænemic from lack of exercise. Plain necessity still serves as the best stimulant to advancement and she has been a busy maiden of late. I fully anticipate that with the return of business confidence we shall see released many an important idea and invention which has had its birth during the last two years but which could not be advantageously pushed under conditions such as these. Some concerns however are finding this period an unusually favorable one in which to experiment with new methods in a small way. It is going to be particularly valuable to us if while waiting for the next orgy of prosperous times we can establish some controls which will automatically assist us in maintaining economical operation when we again center our attention on big business and forget the value of eliminating wastes.

The importance of controlling the expense of clerical service grows greater with each succeeding year because this is an expense which is rapidly becoming a larger portion of our total cost. The United States Census of 1890 showed a total of 800,000 clerical workers. By 1920 this had grown to 2,950,000, or an increase of 270% in the space of 30 years, while in the same time population had increased only about 70%. This trend is significant and since it seems to be an inevitable accompaniment of the larger business units we operate today, the sooner we center attention on the securing of some semblance of efficiency from this great army of clerical workers the sooner we shall stem the tide of narrowing profit margins.

There is nothing essentially new in the idea of measuring the output of clerical workers. They are merely producers of a particular class of output and we have been measuring human output with increasing success for years. In fact our activities in that line as applied to manufacturing operations has become almost a science. Many have felt, however, that while this new science has demonstrated its value in the case of shop workmen its application to office brain workers was quite another thing. This assumes that the chief asset of the shop man is a strong arm and that the clerical worker is characterized by a highly developed brain. On the contrary many of the tasks to which measurements have been applied in the shops are those requiring considerable technical knowledge and judgment. Blueprints must be deciphered, a high degree of mechanical skill is often demanded, there must be a familiarity with materials and intricate machine tool equipment, all requiring an active brain to guide the strong arm. Neither is it true that all clerical work requires great powers of thought. In fact office work has been going through many of the same phases through which manufacturing operations previously passed. First there has been the increasing specialization of clerical duties and following that the introduction of more and better office machines. It was this specialization and mechanization of shop work which largely prepared the way for time study work and the application of wage incentives, and the same trend has been taking place in our offices without our realizing its full significance and the new possibilities it opens up to us.

Much of our office work today is little different from that of the shop. In both cases tangible units of output are being produced. In the one case castings and machines or assembled items, while in the office we produce punched cards, sheets or strokes of typed material, ledger postings, calculations, shipping reports, invoices, index cards and a large variety of other definite units of work. The accurate measuring of tasks of this sort should hold no terrors for the time study expert who has struggled with and succeeded in setting standards on such activities as stores attendants, switchboard wiring, assembly of an electric locomotive or the creation of formulas which will determine an accurate time standard for the machining of an article regardless of the kind of material from which it is made or the size of the rough stock from which it is to

be produced. Let us get out of our minds the idea that there is any inherent difficulty in securing measurements and setting financial incentives on a large portion of our office activities. I, of course, do not suggest that you start your campaign by analyzing the activities of your controller or president. They and many others whose prime activity is the exercise of judgment will probably remain outside the field of measured standards, but by the time you have mastered some of the easier tasks, who knows but a technique may be developed which will make it possible to bring these functionaries under real scrutiny.

While such an approach to office work is going to be an entirely new field to most concerns it is by no means an untried field. Considerable attention has been given it by such companies as the following:

Westinghouse Electric and Mfg. Co.
Chicago Mail Order Co.
Dennison Mfg. Co.
Gillette Safety Razor Co.
McGraw-Hill Publishing Co., Inc.
General Electric Co.
Aetna Life Ins. Co.
National Cash Register Co.
Edison Electric Appliance Co.
Cheney Bros.
Procter & Gamble Mfg. Co.
Chrysler Corp.
Western Electric Company.

As an indication of the classes of work which probably offer the most ready approach for measurement, the following might be taken as examples:

Comptometers
Tabulating machines
Mailing Depts.
Typing
Accounts Receivable ledgers
Accounts Payable ledgers
Stores ledgers
Duplicating
Filing
Payroll work
Timekeeping
Purchasing
Invoicing

It is probable that 80% or better of our clerical forces can be ultimately operated under standard measurements and wage incentives. In the Westinghouse Electric and Manufacturing Company we have approximately 200 office employees working under standards of measurement and have of course made only a small dent in the total. We proceeded rather slowly at first in order to assure ourselves that our method of setting standards and the type of bonus plan used were such as seemed desirable to extend generally. During the last year, however, we have definitely organized to push this work, for the early results showed marked reductions in the clerical costs, along with increased earnings for the employees involved. Where the applications have been made, there has developed a cost reduction of about 23% as a general average. This is low because of the youth of many of the installations and in some of those which have been in operation for a year or more the saving has been as much as 70%.

When manufacturing departments first attempted the setting of standards it was done by reviewing past rates of production and offering increased earnings when these previous production rates were exceeded. In initial experiments with clerical incentives the same practice has often been followed and definite improvements have been secured. While such a free and easy method of standard setting may be justified as a quick means of demonstrating to a management the possibilities which lie in establishing financial incentives for office work, those standards will never develop the full benefits to be secured. With a modern time-study man, the time allowance on a job is merely the by-product of his main goal. His chief interest is in the analysis of the job and the methods applied to it. Without such analysis there will continue to exist in the operation a number of conditions restricting the possibilities of output little realized by either the operator or the supervisor. Nor does it require time-study men with a wide knowledge of office work to bring these things to the surface. It might seem a far cry to requisition a time-study man from the shop and ask him to improve methods and administration of work in an office department, but I am not theorizing when I say it can be done with great profit. One of the characteristics most strongly developed in a good time-study man are his powers of observation. He has a keen scent for waste motions and inconvenient arrangement of facilities, and

augmenting this training on his part is the assistance he gets from the mere technique of modern time-study methods which force to his attention conditions which would ordinarily lie unnoticed. His study usually starts with a general observation of the work to see first whether or not materials used are in the most convenient location, that equipment is in proper working condition, and what obvious waste motions might be eliminated. He then decides on what break-up should be made of the task into elemental operations for individual study. A succession of time checks are then made on each of these elemental operations, and when such checks show a considerable variation in the recorded time of any one of the elements, he is prompted to more closely observe that element in an endeavor to determine the waste motions or improper conditions which are probably responsible for the occasional excessive time. Many of these conditions would escape the ordinary observer, but prompted by the variations in his time recordings he knows trouble of some sort exists and by the segregation to elements he knows on just what part of the job to center his further study. Having found and corrected the conditions responsible for the excessive time appearing in a few of his checks, he then selects from the balance of his recordings a reasonable average of time taken, and after adding a percentage to allow for fatigue and personal needs, he arrives at the time standard by which the job is to be measured. That time standard is likely to be an eye opener to those most conversant with the work of the department. The first reaction is usually one of concern for the sanity of the time-study man and the second is likely to be resentment at the suggestion that previous administration of the department could have been so inefficient. At this point must begin a patient and tactful presentation to the department head a list of the hindrances which have been curtailing past production and which have been brought to the surface through the analytical study of sub-operations. The proposed time limit of course assumes the correction of all these conditions before incentive work is started for until then any bonus under the limit would remain beyond the reach of the operators. In short I am going to state here what I shall probably repeat before I am through, namely, that these time standards are not so much a measure of the operators as they are a measure of the department administration, but by paying bonuses to the operators you make them in-

terested parties in seeing that having once established proper working conditions, they are maintained rather than allowed to slip back as might otherwise so likely be the case.

Not infrequently where one time standard was originally contemplated for an operation it will be found that two or more standards are really desirable. In card punching for tabulating machines we may be punching only 10 columns for one class of work while for another such as sales analysis we may be using 45 columns. Obviously, if the card is to represent a unit of work different time allowances should be established for each of these classes of cards. In a similar way, when we approached the setting of standards for typing activities we decided to install on the typewriters devices which record the number of strokes made. In time studying the job however we found that there existed a considerable difference in speed possibilities on various classes of work. The greatest speed could be secured in typing from shorthand notes or printed copy. About 12% longer time was required for typing from longhand copy or from dictaphone cylinders and in this group we also placed the cutting of stencils and typing for rotoprint. Practically 100% increase in time was needed for the typing of tabulated work or for what we call "fill-ins" where the typed matter is scattered and must be definitely located in spaces provided on the forms, such as invoices or purchase orders. It also seemed desirable to set up an additional allowance for each sheet of paper handled by the typist since there was so large a variation in the number of copies required. Another allowance was made for the handling of dictaphone cylinders. This separation of allowances for various classes of work largely eliminates the possibilities of unfair distribution of work to the typists within a group and avoids the danger of a composite limit becoming obsolete because of changes in the character of work flowing into a department. This segregation of limits might seem to greatly complicate the clerical work involved in the calculation of production by each operator and while there is of course some addition of this sort it is not as serious as might be imagined and avoids other conditions which could be much more disturbing.

Were we to stop with the mere setting of time limits on a clerical activity and make no attempt to add financial incentives for accomplishments under these limits, much would have been gained

for there would have been developed a picture of individual and departmental efficiency invaluable in a proper administration of a department. The average individual about an office prefers to at least look busy and that is particularly so when as in the past two years forces have been steadily reduced. Under such conditions, operators will slow down their pace to meet the reduced flow of work in the department and I challenge any office supervisor to approach even close to an estimate of the real efficiency of his department, unaided by reports based on carefully worked out standards of measurement. Valuable, however, as these reports are as an aid in administration there are further advantages to be gained through the payment of bonuses to those whom the reports indicate as highly efficient.

I am not going to enter into any discussion of the various existing plans for the payment of bonuses. They cover a wide range and individually have different accomplishments which they are seeking. Most of them however will reach the main goal you are after—namely, the stimulation of the worker to improved effort and interest in maintaining proper administration of the department—and all of the plans start fundamentally with a time standard within which the work should be done. So without taking time to dwell on our reasons for adopting our particular method of bonus payment I will briefly outline it. We will assume that in the course of a day an operator has actually worked eight hours. In that time she has spent one hour idle because there was no work to do. In the other seven hours she has produced 90 units of work on which the time allowance was .1 hour each, making a total allowed time of nine hours. She has accordingly turned out nine hours of production in seven hours actual working time, thereby saving two hours, and her bonus for the day becomes 75% of her salary for the time saved. You will notice that we eliminated her hour of idleness from the incentive calculation since it was through no fault of hers that we did not provide her with work. For that hour she receives her regular fixed rate. However that hour along with all other idle hours of the department appears in the monthly or even daily production report of the department and offers a definite indication to the supervisor as to the possibilities of further reduction in force. But for the financial incentive this idle time would ordinarly be hidden through a general slowing up

of the work but under our plan the operator has every inducement to maintain a high efficiency while she has work, knowing that it increases her bonus and still gives her the regular rate of pay when work runs out.

We will continue to center our discussion about a typing group merely for purposes of illustration. The time spent in taking dictation is treated as non-incentive time, for the habits of those dictating are so various that to adopt an average as a standard seemed dangerous. If the dictater is one given to interspersing his dictation with a great deal of social chatter he will at least receive but little help or encouragement from the stenographer whose preference will be to get back to work which has bonus possibilities. While in a typing department each operator receives bonus depending entirely on her own work, there are other types of clerical activities where because of cooperation required between the various members it seems better to treat all the members as one group and prorate the entire bonus of the group to the individual members based on the individual fixed rates and the amount of time spent by each on the group activity. Possible examples of this group application are invoicing and purchasing departments though much will always depend on how the departments are organized and to what extent specialization exists.

It is natural for a clerical employee to assume, just as the shop worker once did, that the application of wage incentives means a high pressure speeding of the operator. To those without previous experience in such applications it comes as quite a surprise to find that the increased output does not arise chiefly from abnormal operator speed but rather, as has been said before, from an improved administration of the work which greatly smooths the way for the operator. When time study in its more modern form became active in the manufacturing departments it developed a picture of mismanagement quite amazing to many. The workman was found able and willing to increase his ouput if given a fair chance but his efforts were being constantly circumvented by conditions which he could not directly control and since as a day worker he was paid a fixed rate whether he produced much or little he felt no responsibility for bringing to his superior's attention the things the latter should know. These hidden fetters to the shop worker's efficiency covered such things as poor service at tool or stock room windows,

improper materials, equipment in poor operating condition, unintelligible manufacturing information, worn out blueprints, waiting for jobs and a variety of other difficulties which if he had continually carried them to the foreman would probably have made him a nuisance and for which he would have had nothing to gain. However with time standards set the workman's lack of efficiency is immediately the subject of investigation by the time-study department itself if the foreman does not soon correct the troubles, and the workman finds his path cleared for increased production. Our offices are full of similar administrative failures and a well-set-up incentive plan quickly brings them to the surface. As an example I will quote from a list of recommendations left by one of my staff after an initial survey of a centralized typing department prior to starting an incentive plan.

1.—Because they are not fastened to the desks the typewriters creep while in use, necessitating frequent readjustments.
2.—Discourage present amount of typing from direct dictation.
3.—Relieve operators of collection and distribution of work.
4.—Make supervisor responsible for keeping stationery racks of operators properly stocked.
5.—Make supervisor responsible for coding of telegrams.
6.—Start campaign of education with those using dictaphones. Dictators now sadly neglecting use of dictaphone slip which should accompany cylinder.
7.—Have extra machine available so operator is not obliged to remain idle during repairs.
8.—Specialize to a greater extent as between copy work, dictaphone work, stencil cutting, shorthand, etc.

These are only samples of obstacles to full efficiency noticed in a preliminary review of a department and many others will be gradually brought to light by the time-study man and by the girls themselves when they are placed under an incentive. As a means of making the supervisor receptive to all constructive suggestions from the operators and to secure her interest in everything making for increased output we pay a bonus to the supervisor based on the average efficiency of all those reporting to her.

The first approaches to the application of clerical incentives in any company deserve very careful study before starting and a

very close follow-up after they are in operation. There is normally a perceptible resistance and suspicion on the part of clerical workers to anything which seems to assume their work has any of the characteristics of the manufacturing departments. They also fear that the adoption of task measurement implies a speeding-up process which brain workers should properly resent. Only by a patient demonstration that better administration of the work is expected to make fully as large a contribution to the improved results as is expected from the workers themselves and that they are being drawn more closely into the improvement of these administrative functions—only then will their suspicions be partly allayed and the job of winning them over is usually completed when they begin to taste the bonus itself. We have no case yet where the employees would willingly go back to the former conditions after they begin earning bonuses and these initial installations are closely watched and discussed by other departments who suspect similar approaches.

We previously stated that specialization was one of the conditions preparing the way for the application of incentives and measurement of work. Much has been done along that line by offices in recent years but a great deal more can be profitably accomplished. There is a general feeling among office supervisors that large advantages lie in having a number of people familiar with a variety of activities, thereby avoiding embarrassment when sickness or vacations intervene. I grant the advantage where a group is very small but too often this Jack-of-all-trades method of operation is continued far too long. The more diversity we insert into a clerk's activities the less efficiently will each of those activities be handled and the more surely will we create a job in which the most flagrant loafing can be successfully hidden. It is also difficult to accumulate a group of activities demanding equal training and ability and as a result we will often find our so-called resourceful clerk occupied on tasks which if properly specialized would be placed in the hands of much lower rated people.

It is a usual assumption that when incentives are applied to an activity there will naturally follow an increase in the number of errors and that special safeguards must be set up to offset this tendency. Paradoxical though it may seem, it has been almost a universal experience among those experimenting with clerical incentives that the percentage of errors actually decreases. In our

own experience we have found the errors so few that in the later installations we have felt it unnecessary to apply any penalties for them when calculating the bonuses. One writer has said that errors usually arise from lack of interest in the job. It may be that the added interest stimulated by the incentive is one of the answers to the reduction in errors. Another answer may be that as work speeds up there is naturally a more concentrated mental application. This is well evidenced in the case of speed contests where the operators make only about one-third the mistakes found in the work of the ordinary typist.

The selection of a proper unit of work is always one of the problems to be carefully considered when aproaching the measurement of a clerical activity. In our first experiments with typing work we decided the proper unit of work would be the key stroke as recorded by counters mounted on the machines.

Some concerns have adopted the square inch of typed matter as the unit of measurement, the area of each letter being determined by laying over the letter a scale on tracing cloth. The typed content of the letter can be seen through the scale and the required area quickly read. The area basis has advantages in departments where ordinary letters form the bulk of the output, but in our case we found much of the typing product consisted of engineering data which called for single, double, and triple spacing on the same page, thereby complicating the ready determination of proper area content. One occasional disadvantage of the use of counters is that they get out of order. They are however checked each morning by having the operator write a standard sentence containing a known number of strokes. Another disadvantage of the stroke unit was that if the typist made some serious error, such as the omission of a sentence or even some lesser error which involved a correction on each of several carbon copies, the problem could be readily solved by consigning to the waste basket what had been written and starting all over again. All this product resting in the waste baskets was recorded on the counters and formed a possible basis for bonus.

The determination of the proper unit of work to use for measurement will often depend somewhat on the number of people engaged in the activity and the amount of specialization in their work. In an invoicing department made up of only four or five

people it might seem best to use the invoice itself as the unit, but in a larger group where there is internal specialization of duties it may be desirable to adopt different units for each of the sub groups. For example, one division of the invoicing group may be devoted entirely to the receiving and recording copies of the orders to be later invoiced; for them the number of orders handled might be the desirable unit. Another sub-division may be engaged in pricing these copies of the order; for them the number of items may serve as the unit of work. Another group may handle the calculating and again the items are used. The typists may be measured by the strokes as recorded by counters or even by number of invoices issued if there is not too much variation in length. In short, each clerical activity needs individual study based somewhat on conditions surrounding the local problem.

The amount of inefficiency existing in the average office today is realized only when you begin to face the requirements demanded by standards developed by time-study men. Part of this inefficiency arises from lack of care in the selection of people properly qualified for the various lines of clerical work. Too often we assume a clerical job requires merely a clerically inclined person without much regard to the marked variance in the demands of the numerous clerical activities. Possibly we have a potentially good file clerk struggling along on a calculating job, or a mathematically inclined person attempting a supervisory function. A good ledgerman will not prove an equally good analyst nor is a messenger girl who may have done a bit of typing in odd moments a properly qualified person to place in a typing group. Heaven help the cost department which is recruited from men who have had previous bookkeeping experience where exact balancing was necessary. The one line needs exactness while the other cries for an active imagination. Not only have we been negligent in the initial selection of our clerical forces but we have often been equally negligent in their training after they are on our rolls. It is conditions of this sort which make carefully studied standards of accomplishment seem quite unreasonable. When setting our typing standards we called for an output of more than twice what had been accepted previously. Cricitism of the standards was rampant though it was noticeably more violent from the supervisors than from the operators. Yet a very large part of the improve-

ment lay in the hands of the supervisors themselves in eliminating conditions which were making large output impossible. With working conditions organized as they should be, our standards were requiring of the operators only about one-fourth the speed actually attained in speed contests. An analysis of the operators themselves revealed in some cases a sad lack of preparation for such a job. You might be interested in observing some of your own typists along these lines suggested by W. H. Leffingwell in his "Textbook of Office Management":

> Are their eyes entirely off the keyboard?
> Are all fingers including thumbs at work?
> Are their nails manicured to the dictates of the Chinese fashion or in line with the needs of a typist?

I found girls in some of our typing departments who had no acquaintance with the touch system. You have men in your cost estimating departments and in many other jobs where approximate calculations are being made throughout the day who have no knowledge of the slide rule. In short, until we have behind each office job a respectable training for that job we have not even started on the road to clerical efficiency, but if we place before ourselves proper standards of accomplishment in each line, we shall soon be actively finding out why these accomplishments seem so difficult and correcting the conditions.

MEASURING OUTPUT OF OFFICE WORK OF ACCOUNTING SERVICE DIVISION

By William Smith, Chief, Accounting Service Division, Hawthorne Station of Western Electric Co., Chicago, Ill.

AS AN introduction to my subject, I am going to read an extract from an address delivered at a monthly meeting of the Society of Industrial Engineers of New York City which is as follows:

"Management is the art of handling men, materials, and machinery for the purpose of producing certain desired results. It is an art that has, in some branches of business, been raised to a high degree of effectiveness, and in some notable examples to what may definitely and without fear of contradiction be proclaimed as scientific.

"The art of management has as yet barely touched the office, and in this field a science of management is wholly absent.

"For years I have realized that there is a vital need for measurement of work done in the office. Few office managers have even the slightest idea of what constitutes a day's work on the part of a clerk. In this matter every office is a law unto itself; comparison is difficult and, therefore, there is no comparison. There is no measuring stick.

"Yet without measurement there can be no comparison, no record of improvement; without measurement, science cannot exist. No matter how many examples industry offers us of improvements through scientific methods of management, the office ignores them as inapplicable, and will continue to ignore them while there is no definite method of measuring its work.

"This neglect of measurement has its natural effect on the employees. It is a matter of common knowledge that the average clerk of today is not the equal of the average clerk of a few years ago in intelligence, training, and ability to perform a large quantity of work. We are diluting the original fund of good clerks by rearing a horde of parasites whose ideal is to avoid work, and who regard it as cruelty that they should be asked to work. They assume, and act upon the belief, that

they are different from other workers and are, therefore, privileged to 'loaf.'

"This is apparently a severe stricture; but note that I state deliberately that 'we' are rearing this parasitical host, and by 'we' I mean those to whom the management of clerical work is entrusted. The clerk is not at fault. His or her natural ability is as great as ever. 'We' have made him what he is. 'We' are the culprits, not the clerks themselves whom we have fashioned."

At the time I read this extract, I had been turning over in my mind for some time the advisability of venturing on a plan to measure office work. This article seemed a bit sweeping and radical, but it contained one thought which struck me so forcibly that I immediately adopted it as a slogan, or a text so to speak, in the job measurement development which was to follow. It is expressed in a single sentence: "Without measurement, science cannot exist."

This means that the office manager who does not believe that measurement can be applied to his work might just as well admit first as last that he does not hope to handle his job in a scientific manner.

Realizing the tremendous job of getting up incentive rates which would have a sufficient degree of accuracy to enable us to determine the rate of pay each employee should receive each week, we decided to embark on a more moderate program. We proceeded to develop a plan of management which would at least enable us to obtain a comparative classification of all employees in a particular group so that we could act more intelligently in such matters as the semi-annual rate revisions and promotions. In other words, we wished to know the best and the worst employee in each group, as far as productive effort was concerned, and the comparative standing of those who occupy the intermediate positions.

We felt that the mild incentive which such a plan would produce would be sufficient to bring about very large savings in groups of employees who carry on simple, repetitive operations. At the same time, these employees would not feel that they were working piece work, which is usually very objectionable to the office type of workers. However, there would

be a constant urge to eliminate lost time and to introduce efficient methods.

In order to give you more details of this plan, I am going to review the various steps which were taken when the first development was started in our Shop Clerical Division in the year 1927.

At the time this development was started, this organization consisted of 655 clerical employees. The supervisory structure was made up of a division chief with two sub-division chiefs, six department chiefs, and 20 section chiefs. Each section chief is the direct supervisor of six or eight small groups of clerks located throughout the shop in the manufacturing departments. Each group has a head clerk and from two to ten clerical employees. All of the clerks in the shop are hourly rated. There is also a central organization of about 50 weekly rated employees located in the regular office area.

The shop clerical division act as the timekeepers for all hourly rated employees in the operating and inspection branches. It is their function to originate time tickets, accounting for all work done in the shop. These tickets must show sufficient information to enable the payroll division to properly pay employees and distribute labor and overhead charges by order number. This organization maintains all records necessary to carry on the work of the operating and inspection branches. It compiles reports and charts required by these branches, including all clerical work in connection with the results and efficiency routines. It furnishes the payroll division with such data as is required for rate revision sheets, vacation pay, and income tax returns for hourly rated employees. It furnishes the cost division with apparatus and piece-part output reports to be used in compiling the cost bulletin. It furnishes certain data in connection with labor hour and machine activity reports used by the accounting results division.

We started with a fixed determination to vigorously push ahead through any and all obstacles to such a state of completion that an actual test could be made of the merits of a fully developed plan. Our goal was to establish a routine by which we could notify every employee in the division, from

the office boy to the division chief, some time during the current week what his overall efficiency, both current and cumulative, had been for the preceding week.

This efficiency figure would be based on just three factors:

1. Volume of work handled.
2. Hours required to handle volume at a basic or bogey rate.
3. Actual hours spent.

The relation of the actual hours spent to the hours required at a bogey rate would determine the efficiency.

The efficiency of supervisors would be based on the overall or composite efficiency of their respective organizations, as it seemed fair to assume that the best supervisor is the one who can develop and maintain the greatest number of efficient employees.

It was decided to have all of our efficiency work, both routine and development, carried on by a separate section reporting direct to the division chief. This arrangement would relieve the line supervisors of the additional work and leave them comparatively free to carry on their regular duties; also, the development work would be speeded up and the methods would be uniform.

We proceeded to launch our program with a full realization of the troubles which were ahead of us. We expected the resentment of clerical employees at having their output measured and reporting hours worked the same as they do in the shop. We realized that we had a real job to sell the plan to a lot of lukewarm people, and we knew that our success in doing so was by far the most vital factor in our scheme of development, because we were depending on the employees to voluntarily eliminate the losses we were after.

We decided to use the method usually followed in modern business for putting ideas across where there is a lot of resistance—high pressure salesmanship. Our employees were our customers, so to speak, and we thought we had a commodity to sell which was bound to prove highly satisfactory to all worthy ones once they made use of it and gave it a fair trial. If we could get all employees to increase their efficiency by even a small percentage, the effect on the division as a whole would be a substantial saving.

In all of our talks with employees, the following points were stressed:

1. That we were trying to help the employees to help themselves by providing a definite line of communication whereby those who were capable would be able to report a true record for their good work. We were, in a way, setting up a simplified, common language which both the employee and the supervisor could use and mutually understand.

2. It was pointed out that the problem of granting just increases at rate revision periods would be greatly simplified by this plan, as we should have a definite idea as to which employees were the most efficient and, therefore, the most deserving of an increase.

3. Emphasis was placed on the fact that an efficiency rating would be very valuable in picking the proper employees for promotion, as there was, of course, always a desire to advance the most valuable ones.

4. Employees were told that if they felt they had ever been held back due to the personal likes and dislikes of their immediate supervisor, they would now have an opportunity to demonstrate that they had been misjudged, as their efficiency record would be compiled by a separate organization from their own and would be based on the forms the employees turned in.

5. Employees were told that this was not a scheme to drive greater effort from people who were already doing a fair day's work. We did not expect to speed all employees up to the gait of those capable of the highest output, but we did expect all to meet an average or mean volume rate once it had been set.

6. Emphasis was placed on the fact that aside from an individual efficiency standpoint, we should obtain data from their records, which would be an invaluable aid in analyzing and studying the whole job by operations.

7. Head clerks and other supervisors were told that we were giving them the very best tools we knew of to assist them in making a success of their work. They would, for the first time, be able to make comparisons of the work of their own organizations. They would have a definite grouping of their employees between the highly efficient, the average, and those below par.

8. Employees were told that their reports of quantity handled would be checked and questioned; that this did not necessarily mean that we suspected dishonesty but rather that we were trying

to protect the big majority who had a high output due to efficient work from the few who showed a tendency to be too liberal in their counts of quantity of work handled.

Setting up the measuring sticks.

The first step was to develop suitable measuring sticks so that all of the work of the division could be properly evaluated and classified. To start the machinery in motion we divided all of the work into a minimum number of general operations to give us the essential information we were after and at the same time reduce the amount of bookkeeping to a minimum. Each employee was required to make out a weekly report, Form 1, showing the output handled per operation and the actual hours spent on each.

It will be noted that the basic operations are comparatively few in number, but each one represents a combination of a considerable number of small operations all of which bear on the same subject; for example, posting employees' records covers all time spent on the following items:

1. Reporting accidents.
2. Requests for overtime passes, back pay, entrance cards, etc.
3. Requisitions for help.
4. Passes to payroll, employment and employees' service departments.
5. Employees' leaving notices.
6. Records of company property loaned, disability absence, clock numbers, etc.
7. All sorting and filing of forms used in connection with handling these records.

As the amount of work covered by all of these small operations is approximately uniform per 100 operating employees, it is logical to group them together. This same method of combining all small operations, which bear on one subject, was followed throughout, thus reducing the weekly report to a single sheet.

After these reports had been issued for a period of about six months, we decided that we had a sufficient amount of data to set up our measuring sticks for each operation. We selected as our unit of measurement the average output per hour per operation over the six months' period. Any employee meeting this rate

M.D. 927-H (11-32)

OPERATION OUTPUT AND EFFICIENCY REPORT

SHOP CLERICAL DEPT. _____ SUPERVISOR _____

SHOP CLERICAL UNIT _____ WK. ENDING _____

OPERATION	OUTPUT	RATE	DEM'T HOURS	ACTUAL HOURS	REQUIRED HOURS	% EFF.	OPERATION	OUTPUT	RATE	DEM'T HOURS	ACTUAL HOURS	REQUIRED HOURS	% EFF.
POSTING							POSTING						
STOCK APPARATUS							ATTENDANCE RECDS.						
ORDERS							EMPLOYEES' RECDS. A						
PIECE PARTS							EMPLOYEES' RECDS. B						
OUTPUT							EMPLOYEES' RECDS. C						
CHANGE NOTICES													
WRITING							WRITING						
DELIVERY (LARGE)							TIME D.W.						
DELIVERY (SMALL)							TIME G.P.W.						
REQUISITIONS							TIME S.P.W. NO. 1						
COMPLETION NOTICES							TIME S.P.W. NO. 2						
							TIME S.P.W. NO. 3						
FILING							FILING						
ACTIVE ORDERS													
INACTIVE ORDERS													
DELIVERY (LARGE)													
DELIVERY (SMALL)													
STD. INFORMATION													
SORTING													
REPORTS							REPORTS						
ALL OTHER							OUTPUT						
MEMORANDA													
OTHER OPERATIONS							OTHER OPERATIONS						
ORDERS CLOSED							SUPERVISION HOURS						
COST REQUESTS							MESSENGER HOURS						
FIG. G.P.W. EARN.							SPECIAL WORK HOURS						
							"V" TIME						

		Dem'dant Hrs.	ACTUAL	REQUIRED	% EFF
TOTAL HOURS WORKED	CURRENT WEEK				
CLERK	PREVIOUS CUMULATIVE				
HEAD CLERK	CURRENT CUMULATIVE				
SECT. CHIEF					
DEPT. CHIEF					

REMARKS

FORM 1

would be considered an average worker and the efficiency rating would be 100%.

You will notice that these averages are not bogey rates in the usual sense of the term, that is, a measure which can be met but is difficult to meet. This was done purposely to emphasize the idea that our measuring stick was only a fixed unit to determine volume of output and not a hard, high standard we expected employees to meet. After the rates were established we started to figure individual and group efficiency on the same form the employees used for reporting their output. These forms were forwarded at the end of the week to the efficiency section which enters the operation average rate and then comptometer operators calculate the hours allowed and the efficiency percentage, which is the relation of actual hours worked to hours allowed at the average rate.

After the efficiency of each employee is completed, the duplicate copy of the output form is detached and forwarded direct to the employee who then knows what his performance was for the previous week.

His record for the past weeks is also accumulated each week so he can compare his present and past records. This cumulative efficiency rating is carried for a period of six months or from one revision period to the next. Thus, the employee sees all details of the efficiency calculations. The volume of work and the actual hours are his own figures. The rates are well known and all calculations can be readily checked.

His weekly statement is an exact copy of the record which is maintained by the efficiency section, to be used at rate revision periods or when promotions are necessary. The weekly efficiency form can be likened, therefore, to a statement of deposits in a bank; in this case the employee is depositing each week a record of his rate of output, and as the cumulative deposits grow, so will his standing powers improve and the prospect of getting more salary increase. This statement then is the practical means of setting up for the individual employee the ever-present incentive which we considered a prime essential in our plan.

The supervisory force, from the division chief down, have a banker's solemn obligation to fulfill their part of the contract and safeguard the deposits. They must also see that all the benefits, which we have told the employees will result from large deposits,

are faithfully carried out even if we may at times be called "efficiency fanatics." It seems safe to say, however, that the errors and injustice which may creep into a straight efficiency advancement program are insignificant compared to those which exist under the usual method of procedure. At least, all of our employees now know just where they stand each week—there is no doubt in their minds—and if they think the records are not fair, they are told that they can take the matter up as far as their division chief if they think it necessary.

General Review

I stated at the beginning that we expected our plan to produce substantial savings. We found after the first year of operation that we had reduced our operating expense in this one division $175,000 per year. During 1928 we extended this same system to other clerical organizations at the Hawthorne Plant. In the payroll division the number of employees was reduced from 331 employees to 256 or a reduction of 75 people. In a centralized typing organization a force of 53 employees was reduced to 41. In general, we were able to reduce clerical expense about 25% after the plan was in full effect.

The most interesting aspect of this whole picture to my mind is that all of this accomplishment was brought about by the voluntary efforts of the employees with no driving on the part of the supervisors.

So much for a brief history of our job measurement development.

We can now proceed to discuss the practical working out of some of the different angles of the development as a whole, the strong points, the weak points, and the general application.

Suppose we discuss the use of efficiency from a control standpoint. Each Thursday there is delivered to the division chief's desk a sheaf of approximately 90 sheets of group efficiency reports covering the whole division. There is a separate bundle of sheets for each department, the top sheet showing the composite efficiency of the whole department; following the departmental summary is one for each section, and back of the section summary are a number of sheets for each group in the section.

A division chief can look over these bundles of sheets and select the department showing the lowest overall efficiency. By examining the section sheets for this department, he can likewise select the section which is causing a low departmental figure. From the section sheets it is an easy step to locate the groups having trouble, and as the group sheets show the operations, the primary source of difficulty can be located.

The control, therefore, is so searching that a division chief, or anyone else for that matter, in less than five minutes' time can find out that some time clerk, away over there in the box shop or foundry, took 10 hours longer to write up time tickets last week than was required. And I imagine the first time that information was carried back to the time clerk, she probably acquired a very wholesome respect for a plan which allowed her division chief to know she was not doing her work properly the week before. She probably felt the presence of the efficiency plan in the weeks which followed and was careful not to have the bad record repeated.

Thus one can get a very condensed and easily read picture of the whole work of an organization of hundreds of clerical employees each week. The weakest spot and the strongest spot can be easily picked out. The operations which may be causing trouble in a number of departments can be readily spotted. The supervisors, from department clerks up, arrange themselves before the division chief each week in their respective order of accomplishment, and it is a natural mental process to note their alignment and realignment as the weeks slip by.

The study of the group efficiency forms each week gives the supervisor a grasp of his work and a sense of confidence and ability to control the job which he never had before.

We can now shuffle the primary forms or individual records from which the group sheets are made up into a different combination and obtain an excellent bird's-eye view of how we are spending our money in the division, as a whole, by operation.

I will cite one instance to illustrate the value of such information. The summary on the reports showed a total of 78 people on this work. With this information as a lead, the report situation in the shop was analyzed and we found that in most cases a large amount of figuring work was required. This work was all being

done by longhand and we were using reams of paper and wearing out lead pencils in laboriously carrying out long division, etc. This, of course, is work for comptometer operators in this day and age, but we know from previous experience in the office that it would not be practical to try and place comptometer operators in the shop. The only thing left to do, therefore, was to take the work out of the shop and organize a central report organization adjacent to a Comptometer service section. This was done at a saving of $38,000 per year.

I have cited this instance to bring out the manner in which job measurement furnishes a supervisor with proper leads as to where he can carry on development work with the expectation of obtaining maximum results.

Rate revision and promotion.

We will next consider the rate revision and promotion feature of the plan. In our selling campaign to arouse the enthusiasm of the general employees, we talked rather plainly on these subjects, as it was realized that probably the first thought and the last thought which they had in mind was where they personally would benefit. In considering this angle of the situation, we have worked up some tables of various classes of work and the earning rate for different percentages of efficiency in each class. The tables referred to are worked up in this fashion:

As our basic rates are average rates, we can say that an employee who is producing average output has an efficiency rating of 100% For any particular class of work we had an established rate range; for example, the starting rate might be 40¢ per hour and the maximum, 50¢ per hour. With this kind of range we could say that the average was half way between the minimum of 40¢ and the maximum of 50¢, or 45¢ per hour.

We could say then that any employee having an efficiency rating of 100% in this class of work should earn 45¢ per hour, and if the efficiency increased to 110%, the earnings would increase 10% over 45¢ or 49¢ per hour.

With such a chart it is possible to determine the earning power of any employee at any time by a reference to two well-known factors: class of work and cumulative efficiency rating.

At the rate revision periods we entered on the sheets the cumulative efficiency rating for the six months' period and the corresponding efficiency earnings at that rate for each employee. A comparison of the present rate and the efficiency earnings gave us something definite and tangible to work with in granting rate increases. These sheets were a pleasing picture for the higher executives, who heretofore have been compelled to look over long lists of typists, routine clerks, etc., and wonder what kind of a job had been done in granting increases. They realized the original recommendations had been made pretty far down the line. About the only guideposts they had were age, length of service, attendance, etc., but nothing as to the real earning power of each individual.

We, of course, had two classes of employees to contend with. The first class consisted of those whose rate of pay was less than their earnings on an efficiency basis. In these cases an increase was granted in proportion to their earnings. Of course, some highly efficient low-rated employees showed that they had earned an increase which was too large to be granted at one period, but they were given such substantial consideration that we had no complaints on this score. These employees will again be eligible for another increase at the next six months' period if their efficiency remains high.

The second class consisted of those whose rate of pay was in excess of their efficiency earnings. These employees were not given an increase even though they seemed to be due at this period according to the tests we have usually applied. These are the most difficult cases to handle, as employees in this class probably have considerable service and have had their rates increased in a rather automatic fashion in the years gone by.

The general basis of increase had been, of course, that employees usually become more valuable with increased service, but when an actual measuring stick was applied, many were found lacking. Those who are grossly overpaid are, of course, special problems to worry over.

With such a set-up the employee very soon gets a pretty definite idea of his earning power in the different grades and will not have to wait until the expiration of the six months' or yearly periods to find out if an increase should be expected. If the weekly indi-

vidual efficiency sheets, which are given to the employees, show a high efficiency and their rate of pay is average, they can reasonably expect an increase at the regular period. However, if the weekly reminders show a low efficiency, they should not experience a very severe shock if no increase is received, as they have indicated from week to week their inability to earn more than their present rate of pay, or else they do not care to exert themselves to such an extent that they will get more money.

Thus one of the worst problems of rate revision will vanish. I refer to the job of trying to convince an employee who has been expecting an increase for six months or a year and who did not get one that the action was justified. I have always suspected that no matter how successful the rate revision interview in such cases seems to be, the employee has always gone back to work with more or less of a feeling of resentment because we have been compelled to talk in generalities as to the employee's value to the company. We have been unable to produce any specific figures or measurement data to substantiate our statements and the employee is usually far from convinced.

We have used such terms as personality, aggressiveness, initiative, aptitude, etc., and immediately we run head-on into a great obstacle, the inherent inability of the human species to see themselves as others see them. The result is that the employee very often goes back to work and indulges in a lot of wild thoughts about favoritism, political influence, "drag," etc., and down goes what efficiency he happens to have.

The next item to be considered is promotion on an efficiency basis. My remarks on this subject will be confined to that large class of employees ranging from the individual routine worker to those in the lower supervisory ranks.

It is very obvious that as we approach the higher supervisory levels we must consider other characteristics which may not be clearly reflected in an efficiency rating in the lower classes; for example, education, leadership, and the ability to grow. However, an efficiency rating should always occupy a prominent place in any supervisor's score of good points for we must not lose track of the fact that his main duty is to produce a maximum amount of satisfactory output at a minimum cost through his ability to direct other people.

The old practice in this organization was to promote employees largely on the recommendation of section chiefs and department chiefs. The section chief never thought of going outside of his organization and the department chief rarely changed the section chief's selection. The section chief is usually very reluctant to disturb an employee who is doing satisfactory work in a particular location, with the result that very often employees would be found on the same job year after year. Generally the one who happened to be foot loose at the time and who personally stood well with the section chief got the promotion. This system, of course, was a prolific source of dissatisfaction and a lot of it was entirely justified.

A promotion with an efficiency system works out in an entirely different manner. If a vacancy occurs any place in the plant for a particular job—for example, a head clerk—the request for a candidate to fill the vacancy must clear through the efficiency section which makes up a list of three or four of the most highly efficient utility clerks in the whole organization, this being the next labor grade below the head clerk classification. One of these candidates must be selected by the department chief to fill the vacancy regardless of where they may be located. This method, of course, breaks down all organization barriers and the field for promotion of the efficient employee covers the whole division. Those employees who know that they stand high in efficiency and on the ranking list are sure that they will very shortly be promoted to a higher class of work.

I will admit that this procedure is not very popular with the supervisors. Even the department chiefs do not seem to get enthusiastic over it yet. The reason is the perfectly natural tendency for every supervisor to feel that his people, whom he has developed and worked with for a number of years, are a little better than others on the same level in other parts of the organization. He is always reluctant to break in a stranger in his particular field of work.

However, when you explain this plan to any individual employee, you never fail to draw a broad smile of satisfaction and the reaction invariably is that if such a scheme is faithfully followed they will have the squarest deal they have ever had. This reaction is a vital factor, as the individual worker is the one who produces

the output. We can without a doubt, by setting up a proper incentive, lead them to look on their daily tasks, small and unimportant as they seem to us, with a certain feeling of proprietorship. In a sense they will feel they are masters of their own destiny to the extent that they can of their own initiative eliminate those small losses which bulk so large in the aggregate and thereby earn the rewards we have held out to them for such action. Such an outlook is bound to build up a more contented and industrious personnel.

So far we have considered what we might call the strong points of the plan and it may be well to dwell for a few moments on the things to be watched, or the weak points. It is realized that one weak spot is that the clerks report their own output. While we can safely assume that the big bulk of the reports are honest, there is always a possibility that some employees in their zeal to excel and build up higher efficiency figures will exaggerate the count as much as possible—a sort of reverse to the tendency of some ardent golfers in counting strokes.

We are especially fortunate in this organization in having two easily determined factors which are the basic control for all of our principal operations; they are the number of operating employees in each group and the number of orders and schedules in file. The number of operating employees is the unit of measurement for such operations as employees' records and attendance records. This item also controls the number of time tickets written. The number of orders and schedules in file in each group control such items as posting change notices, posting deliveries to orders; also writing completion notices and filing active and inactive orders.

Another means we use is to make a periodical clerical inspection in each group by a man under the control of the efficiency section. He spends all of his time on this work and no one knows where he will land for an inspection. He stays a few days or a week in each group, and while going over the routines and methods, he is careful to note the output in his report and to check the actual hours charged. Of course, no clerk wants to report a high output from week to week and then have the clerical inspector find a big drop-off during the week he is in the group.

The competitive spirit which has developed always puts the high efficiency group in the limelight and they know they must be pretty sure of their output, as the department chiefs having the low efficiency groups probably will be prowling around to find out how the high efficiency is maintained. It would be rather disastrous to be compelled to admit the output had been inflated.

Another factor which must be carefully watched is errors made by those who grow careless in trying to make a high efficiency. Up to this time we have not noted any tendency in this direction. The explanation probably is that busy employees with their minds on their work are not the ones who make errors. Probably most mistakes are made by those who are doing a small amount of work with their subconscious minds, but with the active conscious portion are talking to their neighbors about a movie they saw last night or some other current event. However, to provide a safeguard, we have set up a system of demerits for errors. The payroll division issues a number of reports covering the errors it finds in our work, which are analyzed by shop departments. We are using them as a check on inspection and charge demerits to each group based on the showing of these reports. Other demerits are based on adverse local inspection reports and failure to follow routines.

Experiences.

I am going to dwell now for a few moments on some of the experiences we have had in watching the growth of the plan. To my mind this is by far the most fascinating angle of the whole development from the supervisor's standpoint. We have laid our plans to produce certain reactions on the part of our employees, and when one by one the tendencies we had hoped for began to crop out, we felt amply rewarded for our efforts.

Little Mary Maloney was a record clerk some place way down in the shop. Her main job was to file copies of orders and other forms in binders. One day about three o'clock she finished up all her work and asked her head clerk for more. The head clerk looked around and found the departmental work all up to date, so Mary was told to spend the rest of the afternoon checking for misfiles. Mary took a fresh chew of gum and settled down for a pleasant little seance of listlessly thumbing over the pages while

her thoughts were roaming miles away. Suddenly her reveries were brought to halt by the thought that she must charge her time to some operation. She decided to ask her head clerk about it and was told to charge her time to "filing orders." Mary immediately protested this action as it would spoil her efficiency. She insisted that she wanted some regular work so she could report her output. Here we have a strange unusual happening, almost a phenomenon. A clerical employee caught up with her work, told by her immediate supervisor to take life easy the rest of the afternoon, and yet she protested because it would spoil her efficiency record.

Perhaps some one may say this is an interesting story, but that I am making quite an issue of a couple of lost hours. However, we must remember that there were at this time about 150 little groups just like Mary's scattered all over the plant. This same incident probably happened in most of them and so we have two times 150 or 300 hours; also, if it happened once a week it might happen several times and we have a possibility of several times 300 hours. Here we see the very essence of our efficiency gain; not a big saving in one place, but a small one that can be made general.

A typist who had always been considered as rather mediocre blossomed out under our plan with a very remarkable efficiency rating. We investigated and found that she had invented a sort of a double shuffle by inserting two forms in her machine at one time. She had trained herself to carry the information for two forms in her mind at one time, so she could type straight across from one form to the other without shifting the machine carriage. I asked this girl why she had not thought of such schemes before. She stated she had and then proceeded to unfold a rather remarkable story. She said she was one of three typists who had worked side by side day after day for the last two years. They all started with the Western Electric Company about the same time and had always received the same increase in pay at the same period. The typist next to her she described as "beautiful but dumb." The girl on the end could work if she wanted to but her attitude was that it did not pay to over-exert yourself for any big corporation because it never got you anything.

This efficient typist had worked hard the first year of her service, but when all three got the same treatment at the rate revision

periods, she arrived at the conclusion that the end girl had the right theory. When efficiency measurement came along, it appealed to her and she decided to give it a trial to see if there was anything in it. At the next revision period she got an increase larger than the combined increases she has had since she started. Here we see a clear case of the blighting influence of the old automatic service increases contrasted with the beneficial results of the job measurement method.

And now perhaps some one may ask, "What is the greatest difficulty to be overcome to introduce an efficiency program?" Probably the answer of most of you would be, "The job of setting up bogey rates, of course." This is not our answer, however, as we firmly believe that effective bogies can be readily set up on any clerical job of a simple, repetitive nature, effective in the sense that they will enable you to analyze your employees between the best, the worst, and the intermediate, a comparative relation regardless of the fact that the rates may be so high they cannot be met, or so low they are too easily met. Our answer is then, that the most difficult task is to sell the idea of job measurement and efficiency rating to the white collar type of office employees and supervisors as the only means of treating their problems and their advancement in a scientific manner. Once that idea is put across and the office employee is happy and contented to work under an incentive scheme, which must of necessity be based on output measurement, the job of setting bogey rates becomes a mere matter of detail calling for careful analysis, to be sure, but never impossible of accomplishment. If you cannot sell the idea to your employees that an efficiency rating is their best and most reliable friend in the business world, you can never get very far with this kind of a program.

And now, in conclusion, allow me to leave with you the two big thoughts I have trtied to emphasize throughout this talk. The first one is that without measurement of some kind, science cannot exist. The measuring stick may be very crude but it is far better than using the usual hit-or-miss methods. It makes no difference whether the job is of a technical, mechanical, clerical, or any other nature, if you are unable to measure its essential characteristics, its volume, its rate of output, then you cannot hope to treat it in a scientific manner.

The second thought, after the measurement of the job has been mastered, is to set up a common language and a definite line of communication with each and every one of the individual employees, the ones who produce the output, so they can be told in a way they cannot fail to understand what is considered a fair day's work and just how much the exceptional ones have exceeded that standard day's work.

The final action is, of course, up to the supervisors. They must use scrupulous care to execute their part of the contract. They must make absolutely certain that those who have responded to their proposals receive the just rewards which have been held out to them.

SALARY REDUCTION AND READJUSTMENT

An Emergency Plan

By E. P. Case, Accountant,
Syracuse, N. Y.

SINCE this outline of an emergency plan adopted by a member industry of the National Electrical Manufacturers Association not only deals with a current financial problem of the budget but also psychological factors affecting the morale of employees, it is important that a brief resumé of the situation leading to the adoption of this plan be discussed.

Our business is a secondary industry dependent primarily on general acttivity for its life blood. A graph of volume therefore shows a decided lag behind other industry both up and down. In addition, however, the drop to lower levels is faster and consequently the action necessary to maintain a balanced budget more drastic.

In response to President Hoover's suggestion that industry withhold reduction of salaries and wages until the general cost of living had dropped, and consistent with its general policy, our company withheld the necessarily drastic reductions in payrolls essential to maintain a balanced budget. With continued business stagnation it was finally necessary to curtail employment by reducing the force, alternation of employees and reduction of wages and salaries by working shorter hours. This orthodox manner of meeting the emergency was followed in all divisions of the business including the factory, engineering, administrative and sales forces. A temporary expedient of one week vacation per month without pay was also adopted in the engineering, administrative and sales divisions.

The emergency developing with the unprecented further decline in the third quarter of 1932 made it apparent that further steps should be taken in reduction including the payrolls in all divisions after the three-month period of vacations had expired August 31. It was deemed advisable to retain all employees possible on a reduced recompense to spread the income over as many families as

possible and to maintain the organization. The more nearly direct relationship between factory operations and volume indicated that the proper manner to approach this problem was to reduce the hours from five to four days per week.

An entirely different problem was confronted in the sales, engineering, administrative and executive divisions. Previous salary reductions in these forces had been more drastic from the employees' viewpoint since the hours were not reduced with the first rate reductions. In addition, the essential work in the administrative units never drops off in the same ratio as volume. It takes as long to edit, enter, invoice and collect an order for $109 as for $901. The basic reports and records of the stores, cost, statistical and accounting departments necessitate practically as much work as B. D. (Before Depression).

The following plan was developed by a committee composed of four members of the department head group including the chief accountant working in conjuction with the treasurer.

The purposes of the plan were:

1. To maintain the cash position of the company as affected by the payroll of salaried employees.

2. To give definite assurance to employees that as their salaries are further decreased by possible decreased business so will they be increased with the return to normal to the extent outlined herein.

3. To avoid undue injury to employees' morale and re-establish and foster confidence for the future.

Starting September 1, 1932, the plan shall continue until such time as decreases in individual salaries have been offset by increases in such salaries.

A standard ratio is to be established between net sales and the salary payroll. This standard to be approximately the three months' cumulative ratio for the period and is accepted as 20%.

This standard ratio is to be applicable to (a), salaries in effect, and (b), to the present salaries of those not included in (a).

(a) If, during any month that this plan is operative, the ratio between the salary payroll and net sales is in excess of the standard ratio established, all salaries will be reduced a proportionate amount to maintain the standard ratio.

Each salaried employee having a reduction in salary from the operation of this plan will receive a proportionate increase (not to exceed 10% of the basic salary in any month) at such time as the current month's ratio is better than the standard and until such time as the entire reduction has been cancelled.

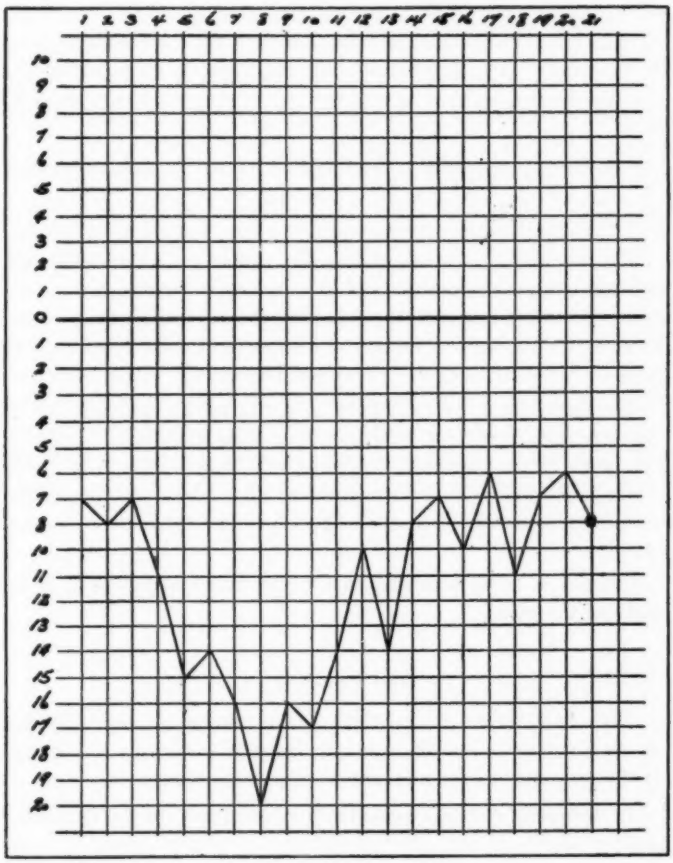

CHART I

All salaries will be adjusted monthly.

(a) This plan is applied to all individuals of the regular office, executive, and sales district payrolls, as well as salaried employees of the factory, alternating employees, and to any employee who is added to the salary payroll.

A chart indicating the variation from standard expressed in percentages as each day's sales and estimated monthly payrolls are tabulated and established will be posted in a conspicuous position in the office. It is understood that this chart is an estimate, and that the final calculated at the end of the month is the accepted ratio.

A blueprint copy of the chart will be mailed to each sales office.

Operation of Plan

The foregoing excerpts outline the salient points and not only indicate the principles followed in planning a means of equitable salary reduction but also suggests numerous possibilities of equitably re-establishing individual incomes by increasing rates in direct relation to the resumption of normal business.

The importance of the chart in picturing the position of the company after entering into a participating plan with employees can be readily recognized. It is essential that the graph be simple and readily read if clerks, salesmen, and others not acquainted with such data are to be able to anticipate and plan their personal budgets.

Chart I is being operated as explained in a supplement to the body of the plan:

SUPPLEMENT

The chart shows across the top the number of working days in each month on which sales are recorded. On the left margin is shown a scale of the per cent of reduction or increase.

A *horizontal red line* indicates the zero point on the percentage scale at which no reduction or increase to salaries occurs. A *blue line* is drawn on the chart as each day's sales of the current month are reported.

To determine the approximate increase or decrease on a basis of the sales and payroll on any day of the month:

1. Locate the *point* at which the *blue line* crosses a *black line* from top to bottom,
2. Follow the *black line* to the top of the chart, which will indicate the number of day's sales recorded of the total to be included in the month as shown by the last number at the right,
3. From the sale *point* follow the nearest *black line* to the left side which will show the percent of reduction on the day shown in (2).

A second chart [not illustrated here] was prepared to indicate the reductions or increases as each month is completed. In this chart the month is shown across the top and the same percentage scale on the left side. This chart is read in the same manner and shows the actual per cent of decrease or increase each month by a *blue line.*

A *green line* indicates the per cent of total decreases not offset by increases as the plan is carried on from month to month. The per cent not offset can be determined by following the nearest cross line to the scale at the right of the chart.

The reports prepared in the operation of the plan indicate the manner in which the calculation is made and the necessary reconciliations to prove with monthly statement figures of salaries. The figures are, of course, not actual but serve to illustrate the plan:

OPERATION OF PLAN

September 1, 1932

Salaried Payroll for September as shown on Exhibit "A"	$ 2,400.00
Salaried Payroll per standard	2,000.00
	$ 400.00
Sales (as taken into Accounts Receivable) per final report for month	$11,000.00
Sales per standard	10,000.00
Additional cash from increased sales	$ 1,000.00
Less 80¢ on every dollar of sales used outside of salaried payroll	800.00
Portion of sales increase used to balance salary payroll per plan	$ 200.00
Reduction of payroll per plan, 8%	192.00
	$ 392.00
Monthly variation by applying nearest 1%	8.00
	$ 400.00

SUMMARY

Our cash for the necessarily increased payroll by eliminating vacations of the summer months came from:

Portion (20%) of sales increase	$ 200.00
Reduction of salary by 8%	192.00
Month variation	8.00
	$ 400.00

EXHIBIT "A"

Showing reconciliation of participating payroll with salaries per statements

Sales less Returned Sales		$1,080.00	
Returned Sales prior to September 1		20.00	
Sales per operation of plan		$1,100.00	
Payrolls per Check Book:			
Special Payroll	$ 840.00		
Office Payroll	460.00		
Executive Payroll	207.50		
Salesmen Payroll	800.00		
Factory Payroll	2,100.00		
		4,407.50	
Include:			
Factory Territory Commission Accrued		$ 30.00	
Office Payroll Accrued		17.50	
Factory Payroll Accrued		5.00	
		$4,460.00	
Exclude:			
Factory Payroll	$2,100.00		
Less participating Group	60.00		
			2,040.00
Sundry Items in Payrolls			20.00
		$4,460.00	$2,060.00
		2,060.00	
Participating Payroll per plan		$2,400.00	

EXHIBIT "B"

Showing the amount retained by reduction as compared to theoretical application of 8%

Amount of deduction per plan		$192.00
(a) Errors in deductions to be adjusted:		
Mr. Brown under deducted	$ .70	
Mr. Black under deducted	.20	.90
		$191.10
(b) Accruals not applicable which balance out month to month	$2.00	
(c) Variation of calculation between four and five-week months of weekly payrolls which balance out month to month	1.50	
(d) Current monthly variations:		
Employees dismissed	.10	3.60
Emergency Plan Reductions as shown by Deferred Liability—Emergency Plan Account		$187.50

All decisions and rulings in the application of the plan to carry out its dual purpose and intent are published in the form of regulations. Copies are sent to all district offices and department heads so that all employees are kept informed and in intimate contact with developments week by week and month by month. The chart is a primary factor in maintaining the morale of our personnel. It can be happily said that because of a gradual tendency towards a resumption of normal volume during September and October we showed progress along all lines outlined in the purpose of the plan.

The adoption of this plan enables our company not only to control through a simple expedient a major item in a continually varying budget, but also inspires a cooperative attitude and *esprit de corps* in employees, which is essential for continued progress toward normal conditions, not only in our own business but throughout "these United States and the entire World."

In a brief outline it is of course impossible to cover all the angles and points subject to discussion. Anyone who finds this tentative

solution of a common problem of sufficient interest and wants more specific details can write our Secretary of the Syracuse Chapter.

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THE TECHNICAL PROGRAM

of the

FOURTEENTH INTERNATIONAL COST CONFERENCE

of the

NATIONAL ASSOCIATION OF COST ACCOUNTANTS

at the

Waldorf-Astoria Hotel, New York City
June 12, 13, 14, 15, 1933

Tuesday Morning, June 13:

The Reconstruction of the Balance Sheet (two papers)

1. Adjustment of Capital Assets and Structure in View of Present-Day Conditions.
2. Case Study of the Factors Which Should Be Considered Prior to the Development of a New Line of Product.

Tuesday Afternoon:

Pricing for Profit (two papers)

1. The Economic Features and Effects.
2. What the Cost Accountant Can Do About It.

Wednesday Morning, June 14:

Municipal Accounting (two papers)

1. The Principles of Municipal Accounting Compared With Industrial Accounting.
2. The Practical Application of Cost Accounting to City and County Functions.

Wednesday Afternoon:

Debatable Points in Cost Accounting.

1. This will be a session similar to those we used to conduct some years ago, at which a number of controversial subjects in the field of industrial accounting will be taken up one by one for round-table discussion.

Thursday Morning, June 15:

Budgetary Control for the Small Business (two papers)

1. Definite Presentation of the Factors To Be Considered and the Results To Be Obtained.
2. The Accounting Mechanics for the Development, Presentation, Control and Revision of the Budget.

Thursday Afternoon:

Standards and Their Application to Distribution (two papers)

1. Problems of the Development of Standards for a Small Business Selling to Producers.
2. Problems of the Development of Standards for a Small Business Selling to Consumers.